Measuring Depositors' Behaviour of Malaysian Islamic Banking System: A Co-integration Approach

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Malaysia has been regarded as one of the committed Muslim countries towards developing a complete Islamic banking system. The system started in 1983 when the first Islamic bank commenced its operations. Since then, many measures and actions have been taken and implemented by the government leading not only towards the development of an Islamic banking system but also an Islamic stock market, Islamic insurance and Islamic pawning operations. Malaysian Islamic inter-bank money market was introduced in the 1994 to facilitate the funds movement among banks and other financial institutions. Presently, there are 22 Islamic banking products offered by commercial banks, merchant banks, finance companies and discount houses. It is the aim of the government that by the year 2010, at least 20 per cent of the total banking assets is held in the Islamic banking system. To ensure that this objective is attainable, Islamic banking players must introduce measures that can attract new depositors, and retain their existing customers. Depositors of Islamic banking system can be categorized into four main categories; government, financial institutions, business enterprises, and individuals. Generally, these groups of customers have different objectives when patronizing bank. It is expected that government sector is not looking for financial reward as compared to business entities. Whereas, individuals who uphold Islamic beliefs see rewards on deposits as a secondary element when making deposits. Using co-integration techniques, this paper highlights the relationship between amount deposited by various groups and factors such as returns given by both Islamic and conventional banks, as well as other macro economic variables, i.e. money supply, composite index, inflation rate, and gross domestic product ratio.

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1. Introduction

After nearly four decades of their establishment, Islamic banks have managed to position themselves as financial institutions, which not only play an important role in resource mobilization, resource allocation and utilization but are also actively involved in the process of implementing government monetary policy. Apart from offering almost all traditional banking facilities, Islamic banks also facilitate domestic and international trades. The first Islamic bank, pioneered by Mit Ghamr Local Saving Bank, was established in 1963 in a provincial rural centre in the Nile Delta (Egypt). At present, there are more than 200 interest-free institutions operating in 40 nations worldwide and providing services that are compatible to those services offered by conventional banks. In 1985, this system mobilized an estimated of US$5 billion fund and presently the figure has risen tremendously to about US$80 billion. Seeing the potential of the Islamic market, western conventional based financial institutions such as Citibank, JP Morgan, Deutsche Bank, ABN Amro and American Express have started introducing interest-free products to customers. Similarly, multinational corporations such as General Motors, IBM and Dewoo Corporation have already begun to use interest-free services.

Similar to conventional banks, Islamic banks also depend on depositors' money as a major source of fund. Bank Muamalat Malaysia Berhad (one of the Islamic banks in Malaysia) for example, had total deposits amounting to 94% of total liabilities and shareholders' equity as at the end of December 2003. In the case of Jordan Islamic Bank, Islamic Bank of Bangladesh, Bank Muamalat of Indonesia, and Bank Sharīʿah Mandiri of Indonesia, the corresponding figures were 94%, 86%, 76%, and 79%, respectively. These figures reflect the overwhelming high amount of the depositors' money as a source of fund for Islamic banks. Hence, it becomes imperative for the management of Islamic banks to understand the factors that are most likely to influence customers' decision making in depositing their money with Islamic banks. With the exception of a study conducted by Metawa and Almossawi (1998) where religion was seen as a factor influencing customers' choice to patronize with Islamic bank in Bahrain, other studies have proven otherwise. The evidence from studies conducted in Sudan and Turkey, for example, showed that religion is not the main reason for customers selecting Islamic banks (Erol and El-Bdour, 1989). Similarly, studies conducted in Malaysia and Singapore finds both religion and profit as the reason for people maintaining their relationship with Islamic banks (Haron et al., 1994; Gerrad and Cunningham, 1997).

Since depositors are motivated by returns, it is important for Islamic banks management to recognize the extent that rates of return on deposits influence their customers' decision to deposit. Besides financial rewards, there are also other macroeconomic variables identified in the existing literature as the potential determinants of savings. Loayza et al. (2000) for example, divided determinant

variables of private savings into nine categories and each of these categories has at least two specific variables. Ozcan et al. (2003) outlined six groups of potential saving determinants, namely government policy variables, financial variables, income and growth variables, demographic variables, uncertainty variables and external variables. Given the importance of this subject and lack of documented findings in the current Islamic banking literature, this study propose to highlight the strength of the relationship between the level of deposits and the rewards given by both Islamic and conventional banks. In addition to this, we will also examine whether money supply, base lending rate, composite index of Malaysian Bourse, consumer price index, and gross domestic products are factors influencing depositor behaviour of whether to save or not with Islamic banks. This paper is divided into six sections: the overview of Islamic banking system in Malaysia is discussed in section two; section three elaborates the theoretical considerations and the review of literature on customers' savings behaviour; section four explains the methodology used in analysing the relationship between variables selected in this study; section five presents the findings; and section six concludes the study.

2. An Overview of Islamic Banking System in Malaysia

The first Islamic bank in Malaysia, Bank Islam Malaysia Berhad (BIMB) was incorporated on March 1, 1983 and commenced operations on July 1, of the same year. The bank now has a network of more than 50 branches. BIMB is not only promoting Islamic banking products through its own operations but is actively involved in introducing Islamic financial products and services through its subsidiaries. BIMB recorded strong growth a year after its inception. Total assets doubled from RM170.7 million at the end of 1983 to RM369.8 million at the end of 1984, with sharp increases of deposits from RM91.0 million to RM274.9 million, and of loans from RM40.7 million to RM249.8 million. As at the end of June 2003, total assets of BIMB was RM13,717 million, whereas total deposits and total loans were RM12,397million and RM6,890 million, respectively. In order to cater for the total banking needs for its clients, BIMB now has subsidiaries dealing with leasing businesses, nominee services, family and general *takāful* (insurance) business, trust funds, and stockbroking.

The development of the Islamic system only began to take force in March 1993, when the Ministry of Finance introduced a scheme known as 'Interest-Free Banking Scheme'. Under this scheme, often known as 'Islamic windows', all commercial banks, merchant banks and finance companies are given the opportunity to introduce Islamic banking products and services. The pilot phase of this scheme was launched on March 4, 1993, which involved the three largest commercial banks in Malaysia. The second phase started on August 21, 1993 with 10 more financial institutions joining the scheme. At the end of December 1993, a total number of 21 financial institutions had obtained the Central Bank's approval to participate in the scheme. As at end of 2002, 14 commercial banks, 10 finance

companies, 5 merchant banks, 2 Islamic banks, and 7 discount houses participated in the Islamic banking system. The total assets, total deposits, and total financing mobilised by these institutions were RM68,070 million, RM53,306 million, and RM36,718 million, respectively (Bank Negara Malaysia, Annual Report 2002).

The second Islamic bank, Bank Muamalat Malaysia Berhad, was established on October 1, 1999 as a result of the Share Exchange Agreement between the Ministry of Finance Incorporated (investment body of the Malaysian government) and Khazanah Malaysia Berhad (one of the companies owned by the Malaysian government) and Commerce Asset-Holding Berhad on February 25, 1999 and the subsequent Vesting Order of October 25, 1999 granted by the High Court, the commercial banking business and certain other banking assets were transferred between Bumiputra-Commerce Bank Berhad, Bank Bumiputra Malaysia Berhad and BBMB Kewangan Berhad. This bank had an initial shareholders' fund of RM300 million, assets of RM2.5 billion, a network of 40 branches and a workforce of 1,000 personnel (Bank Muamalat, Annual Report, 2000). At the end of 2003, the total assets, total deposits and total financing of this bank were RM7,315 million, RM6,846 million, and RM2,140 million, respectively. Similar to conventional banks, all banking facilities such as deposit account, financing and other products and services are available at Islamic banks. As at end 2003, Bank Negara had introduced a total of 22 banking products and services for Islamic banking system in Malaysia (www.bnm.gov.my).

The annual growth and the amount of funds deposited in various deposit facilities for the last five years in the Islamic banking system are shown in Table 1. With the exception of savings account, which continue to enjoy a positive double digits growth annually, both demand and investment deposits experienced a negative growth for the year 2001 and 2003 respectively. In the case of demand deposit, though it continues to have a double digits growth for the last three years, this growth however is at a declining trend.

Table 1: Annual Growth (%) and the Amount ('million) of Various Deposit Facilities of Islamic Commercial Banks.

	2000	2001	2002	2003	2004
Annual Growth of Deposit Facilities:					
Demand	22.1	(-1.8)	42.4	19.5	17.4
Savings	30.2	23.9	33.6	27.8	31.8
Investment	39.6	40.6	1.8	(-7.6)	44.1
Annual Growth of Total Deposits	33.8	28.2	12.9	3.4	34.8
Amount of deposits					
Demand	6,563	6,451	9,185	10,973	12,887
Savings	2,895	3,587	4,792	6,127	8,073
Investment	16,941	23,814	24,246	22,414	32,313
Total Deposits	26,399	33,852	38,223	39,514	53,273

Source: Bank Negara Malaysia Monthly Bulletin (various issues).

3. Theoretical Considerations and Review of Literature

Rate of interest has always been featured as one of the important considerations in explaining the saving behaviour of individuals. Savings, according to classical economists, is a function of the rate of interest. The higher the rate of interest, the more money will be saved, since at higher interest rates people will be more willing to forgo present consumption. Keynes (1936), despite arguing the quantitative importance of the interest rate effect, believes that in the long run substantial changes in the rate of interest could modify social habits considerably, including the subjective propensity to save. Friedman (1957) in his neoclassical analysis of the consumption function suggested that the main variables determining the average propensity to consume are 'the rate of interest, the relative dispersion of transitory components of income and of consumption, the ratio of wealth to income, and the age and composition of consumer units'. In view of the importance of the rate of interest on consumption, many researchers using various methodologies tried to establish the strength of relationship between these two elements. Wright (1967), Taylor (1971), Darby (1972), Heien (1972), Juster and Watchel (1972), Blinder (1975), and Juster and Taylor (1975) in their studies found an inverse relationship between interest rate and consumption. Modigliani (1977) based on his works and after seeing evidence on the effect of interest rate on consumption concludes that the rate of interest effects on demand, including the consumption component, are pervasive and substantial.

Each of the different types of deposits available at the conventional banks carries a different rate of interest or yield to the depositor. In general, the longer the maturity of a deposit, the greater the yield that must be offered to depositors, in part because of time value of money and the frequent upward slope of the yield curve. For example, notice of withdrawal (NOW) deposits and money market deposits (MMDAs) are subject to immediate withdrawal by the customer and, accordingly, interest rate offered to these depositors is among the lowest of all deposits. In contrast, negotiable CDs and time deposits of maturity a year or longer often carry higher rates. Similarly, savings or thrift deposits are designed to attract funds from customers who wish to set aside monies in anticipation of future expenditures or financial emergencies. These deposits generally pay significantly higher interest rates to customers than transaction deposits do, particularly for those deposits the customer agrees to hold with the bank for several months or years.

Conventional bankers have learned that deposit pricing can be used to shape the kind of customer base each bank can best serve. Changing deposit prices affect not only spread between bank loan rates and deposit interest rates but also customer balances and deposit mix decisions, which in turn, influence both bank growth and profit margins (Edmister, 1982). As Rose (1991) points out, deposit pricing is best used to protect and increase bank profitability, rather than to simply add more customers and to take market share away from competitors. Indeed, when new

deposit plans are introduced, its biggest appeal and greatest chance for success lies with those customers who already hold deposits with the bank. And even those customers the bank already has will not automatically pay higher prices for deposit services. They will pay no more for a deposit than the sum total of its benefits to them and will go elsewhere when the value of those benefits falls below the deposit's price or if a competitor offers a significantly better package of services.

In summary, two important elements emerge from this overview. First, is the acknowledgement by conventional banks that those who are willing to part with their monies must be rewarded. Second, is the recognition that different types of deposits carry different amount of returns or rewards. Therefore, if the management of Islamic banks believe that the attitude of depositors of Islamic banks is indifferent to those of conventional banks, the same rates of return should be rewarded with rates of conventional banks. However, such a belief poses several serious repercussions. For example, interest rate will continue to have an influence on the operations of Islamic banks as long as this thought remains in the mind of their management. Findings of Metwally (1997), for example, confirmed that conventional and Islamic banks offer their depositors similar returns.

Although some empirical research have found evidence to suggest that people who patronise Islamic banks seek monetary rewards, this is not necessarily true for all cases. In 1984, Kuwait Finance House decided not to distribute profits to their depositors, but this action did not result in massive withdrawal of deposits, as one would expect if depositors were profit oriented. Similarly, Islamic banks in Sudan have never rewarded their current account holders, but a bulk of their funds is supplied through these facilities. As institutions whose foundations are based on religious doctrines, it is paramount for Islamic banks management to understand the existence of other factors that dominate the economic behaviour of Muslims. These principles comprise of the belief in the day of Judgement and the life in the hereafter, the Islamic concept of riches, and the Islamic concept of success. All of these principles are expected not only to have a significant impact on the decision-making process of Muslims, but also to have an influence on their perceptions of Islamic banks.

According to the first principle, the choice of action is based not only on the immediate financial returns but also on those returns in the hereafter. Based on this, the decision to place deposits with Islamic banks should not be due to profit motives but rather to gain the blessings of Allah and one of the ways to achieve this is for Muslims to support any programs that serve to improve the welfare of Muslim communities. Since Islamic banks operate on an interest-free basis and their establishment is designed to enrich the Muslim communities, Muslims who support these banks are therefore considered people who achieve salvation as indicated by Verse 20 of Al Tawbah.

In the case of the second principle that involves wealth, Islam has given a clear guideline to be followed by Muslims. In Islam, wealth is a bounty from Allah and

is a tool that may be used for good or evil. Poverty is, in some instances, associated with disbelief and riches are considered a gift from Allah. Wealth itself is considered as an important means by which man can pave the way for the attainment of his ultimate objective. All persons are exhorted to work to earn a living and to accumulate wealth. Accumulating wealth is considered among the highest blessings bestowed on man and everyone is encouraged to strive for wealth (Verse 10 of Al Jumu'ah).

The methods of earning, possessing, and disposing of wealth, however, must be in line with Sharīʿah. The best method of accumulating wealth as defined by Sharīʿah is by striving to succeed on one's own and not from the income generated from other peoples' efforts. This is in line with many ḥadīths in which the Prophet (pbuh) had given his advice to Muslims to work for their own food. Based on these ḥadīths, Muslims should not regard rewards to be given by Islamic banks as a source of income.

The Islamic concept of riches also serves as an important factor that influences Muslim attitudes towards the existence of Islamic banks. Islam defines success as the level of obedience to Allah and not the accumulation of wealth. Service and obedience may be rendered by the positive use of capabilities and resources given by Allah. According to Islamic teachings, if a man really wants to serve Allah, the utilisation of the natural and human resources made available to him is not only a privilege but also a duty and obligation prescribed by Allah. This is in line with Verse 27 of Al Anfal which commands Muslims not to betray the trust given by Allah and His Apostle. Applying this principle to the banker-customer relationship would mean that the customer should not be discouraged by the low profits obtained or limited success of Islamic banks.

In light of these three principles, Islamic bank customers are expected not to be guided by the profit motive. Instead, the reason for placing their monies with the Islamic banks should be directed towards receiving blessings from Allah and this action is considered the best way of managing the resources given by Allah. Since it is the belief of every Muslims that all properties belong to Allah, returns on their deposits are also considered a gift from Allah irrespective of amount. Similarly, in the case of loss, it is all from Allah.

Despite an extensive literature on savings behaviour, there are not many studies, which focused primarily on the factors that determine the level of deposits made by various categories of depositors at the commercial banks. In the past, efforts were made by researchers to determine private saving behaviours not only for a particular country but also as a cross-country comparison. These studies, however, concentrated mainly on private and household savings and not on the business and government sectors. Lambert and Hoselitz (1963) were among the first researchers to compile the works of others on savings behaviour. They edited the works of researchers who studied the savings behaviour of households in Ceylon (now Sri Lanka), Hong Kong, Malaya (now Malaysia), Pakistan, India, Philippines, and

Vietnam. Snyder (1974) did a similar study but reviewed the econometric models employed by others. Browning and Lusardi (1996) also presented an excellent review on micro theories and facts on households saving. Finally, Loayza et al. (2000b) listed papers and publications of the saving research project of a particular country and gave general reference in this area. Since then, studies on savings have continued to become an area of interest by researches. Some of the recent works on savings behaviour of a particular country are the works of Cardanes and Escobar (1998), Rosenzweig (2001), Kiiza and Pedreson (2001), Athukorala and Kunal Sen (2003), Dadzie et al. (2003), Ozcan, et al. (2003), Athukorala and Tsai (2003), Qin (2003) and Hondroyiannis (2004). There are also a number of empirical literature that makes cross-country comparison. Amongst them are the works of Doshi (1994), Masson et al. (1998), Loayza et al. (2000a), Agrawal (2001), Anoruo (2001), Sarantis and Stewart (2001), Cohn and Kolluri (2003), Ruza and Montero (2003).

4. Data and Methodology

Based on the discussion and elaboration presented in section three and section four, the explanatory variables selected for this study are the interest rates on savings account (RSCV) and fixed deposit accounts (ARFDCV), rates of profit for Islamic savings account (RSIS) and Islamic investment accounts (ARIIS) (instead of calling fixed deposit accounts, this facility is known as investment account facilities at Islamic banks), base lending rate (BLR), Kuala Lumpur composite index (KLCI), consumer price index (CPI), money supply (M3), and gross domestic product (GDP). In the case of Islamic banking environment, the selected variables are expected not to have any relationship with the deposit level at Islamic banks (refer back to the theoretical consideration). Though it is hard to believe that Muslim customers are not influenced by any of these determinant variables, we seek to investigate whether these variables does have similar impact in both banking environments.

Interest rates on savings and fixed deposit facilities of conventional banks and rates of profit for savings and investment account facilities of Islamic banks are considered financial variables in the literature and have always been featured as one of the important considerations in explaining the saving behaviour of individual. Savings, according to classical economists, is a function of the rate of interest. The higher the rate of interest, the more money will be saved, since at higher interest rates people will be more willing to forgo present consumption. Based on utility maximisation, the rate of interest is also at the centre of modern theories of consumer behaviour, given the present value of lifetime resources. Conventional theory states that the net result of a change in rate of return is theoretically ambiguous because of potential substitution, income and revaluation effects. An increase in rate of return tends to encourage individuals to postpone their consumption and save more in the present period in order to attain higher

level of consumption later. In this sense, the substitution effect of a change in interest rate on savings is positive. The direction of the income effect on savings depends on whether the individual is a net lender or borrower. A net lender receives more in investment income than the amount he has to pay to service his existing debt. In that case, high interest rate increases net investment income, thus encouraging present consumption and lessening the need to save in order to finance future consumption. Interest rate has another indirect effect on savings behaviour, i.e. the revaluation effect. High real interest rate results in a fall in non-human wealth, mostly through a decline in the real value of financial assets on which interest rate is fixed for several years in advance. The revaluation effect works in similar direction as the substitution effect as it acts to decrease present consumption and raise savings with the purpose of maintaining constant the real value of the stock of wealth. The usual presumption is that the total effect on savings of a change in the interest rate is positive. Nevertheless, empirical research has reported mixed results with respect to the sign of the direct effect of interest rate on savings.

BLR is yet to be used by other researchers as one of the determinants of savings. BLR is the lowest rate charged by banks on their loans. Changes in the rate will have a direct relationship with the credit availability to customers. Increase in the rate means higher cost of borrowing to customers and also serves as an indicator whether they can easily obtain financing for their needs as well as their capacity to pay back the loans. When people are refrained from extensive borrowing, this probably induces them to save for contingencies and for the purpose of buying houses, cars, holidays abroad and other expenses. Therefore, BLR is expected to have a positive relationship with savings. This variable also can be used as proxy for financial liberalization. In most cases, central bank is responsible in determining the BLR of banks in the country. One of the indicators for liberalisation is that banks are free to choose their rates. Hence, frequent changes in lending rates reflect the openness of the country. Based on this conjecture, we hypothesize that as a country becomes liberal, savings rate will rise in tandem with this development. Another new variable introduced in this study is the KLCI. This variable represents the future growth in the economy and the confidence level of people towards the economy of the country. If people are optimistic about the economic growth, instead of putting their money in the bank accounts, they will buy stocks hoping that they will benefit from higher dividend rates and capital gains. Therefore it is expected that this variable will have an inverse relationship with deposits.

CPI is used as a proxy for inflation and inflation is expected to increase saving for two reasons. First, theory postulates that greater uncertainty should raise savings since risk-averse consumers set resources aside as a precaution against possible adverse changes in income and other factor. Second, inflation could influence saving through its impact on real wealth. If consumers attempt to maintain their target level of wealth or liquid assets relative to income, saving will

rise with inflation. Money supply or M3 is one of the tools used by the government in managing its monetary policy. Changes in money supply can have a major impact on economic conditions. An increase in money supply makes loanable funds cheaper, thus reducing cost of borrowing for corporate and individual customers. Hence, it is expected that people will increase consumption and reduce savings. Therefore, money supply is presumed to have an inverse relationship with deposits.

The growth in the economy is represented by GDP. Most empirical literature has shown an ambiguous relationship between savings and growth. Similarly, the direction of causality between these variables is still under much debate. The simple permanent-income theory postulates that higher growth reduces current savings because of higher anticipated future income. Thus, urging people to dissave against future earnings. But in the life-cycle model, growth has an ambiguous effect on savings, depending on which age cohorts benefit the most from the growth, how steep their earning profiles are, and the extent to which borrowing constraints apply.

Based on the above explanations, we formulated six different models as follows:

i. GdCA = *f* [ARIis , ARFDcv , BLR, KLCI, CPI, M3, GDP]

ii. BdCA = *f* [ARIis , ARFDcv , BLR, KLCI, CPI, M3, GDP]

iii. IdCA = *f* [RSis , RScv , BLR, KLCI, CPI, M3, GDP]

iv. IdSA = *f* [RSis , RScv , BLR, KLCI, CPI, M3, GDP]

v. GdIA = *f* [ARIis , ARFDcv , BLR, KLCI, CPI, M3, GDP]

vi. BdIA = *f* [ARIis , ARFDcv , BLR, KLCI, CPI, M3, GDP]

vii. IdIA = *f* [ARIis , ARFDcv , BLR, KLCI, CPI, M3, GDP]

where;

GdCA : Total government deposits in the current account

BdCA : Total business deposits in the current account

IdCA : Total individual deposits in the current account

IdSA : Total individual deposits in the savings account

GdIA : Total government deposits in the investment account

BdIA : Total business deposits in the investment account

IdIA : Total individual deposits in the investment account

The data for this study are taken from the monthly statistical bulletin of Bank Negara Malaysia (www.bnm.gov.my). The study uses monthly data covering the

period from January 1998 to December 2003. In examining the determinants of deposit levels of both Islamic and conventional banks, the paper employs recent advances in time series econometrics. These techniques are cointegration tests and error correction model framework, which are conducted within the vector autoregression (VAR) framework. The first step of the analysis is to test for the presence of unit roots of the variables in the system using the Augmented Dickey-Fuller (ADF) test. Once the stationary condition is examined, the next step is to conduct a cointegration test. A multivariate test for cointegration developed by Johansen (1988) and Johansen and Juselius (1990) is used in this study. The Johansen-Juselius (JJ) procedure of cointegration test is based on the maximum likelihood estimation of the VAR model. The test is carried out through a VAR system such as follows:

$$Dt = \beta 1Dt\text{-}1 + \beta 2\ Dt\text{-}2 + \ldots + \beta k\ Dt\text{-}k + \alpha + \upsilon t\ ,\ t = 1, \ldots, T \qquad (1)$$

where Dt is a (n × 1) vector of I(1) variables; βi are (n × n) matrices of parameters; α is a (n × 1) vector of constant; υt is a vector of normal log distributed error with zero mean and constant variance; and k is the maximum number of lag length processing the white noise. The trace and maximum eigenvalue statistics are calculated to test for the presence of r cointegrating vectors.

If cointegration is found, a vector error correction model (VECM) is constructed. However, if no cointegration is found, the analyses will be based on the regression of the first differences of the variables using a standard VAR model. Engle and Granger (1987) showed that cointegration implies, and is implied by, the existence of an error correction term. This means that changes in the dependent variable are a function of the level of disequilibrium in the cointegrating relationship (captured by the error correction term) as well as changes in other explanatory variables. Once the variables are found to be cointegrated, a vector correction model (VECM) will be used to investigate the dynamic interactions among them in the system. The Granger representation states that for two cointegrated variables, an ECM can be found in the following form:

$$\Delta Yt = \beta 0 + \beta 1\Delta Xt + \beta 2\epsilon t\text{-}1 + \upsilon t \qquad (2)$$

where ϵt-1 represents the error correction term which captures the adjustment toward the long-run equilibrium and β2 is the short-run adjustment coefficient.

For each variable in the system, innovation accounting techniques can be used to ascertain how each variable respond over time to a shock in itself and in another variable. This can be done through impulse response analyses. An impulse response function essentially maps out the dynamic response path of a variable to a change in one of the variable's innovations. This function shows the degree of international transmission among variables as well as the speed and length of time of the interaction between them.

5. Findings

The results of the unit root tests are given in Table 2. As can be seen, the null hypothesis of the existence of unit roots was not rejected at the level form of the data but was accepted at the first-differenced form for all variables. Hence, it may be concluded that each data series is stationary and integrated of order 1 or I(1).

Table 2: Results of ADF Unit Root Tests

Variable	Level	First Difference
lnIdSA	-0.7212	-7.2619*
lnGdCA	-1.0703	-7.2683*
lnBdCA	-1.6639	-5.5235*
lnIdCA	-1.3033	-6.0345*
lnGdIA	-2.5228	-5.3471*
lnBdIA	-1.9222	-6.3964*
lnIdIA	-2.5040	-4.3887*
RSis	-2.5417	-3.4101*
RScv	-2.8387	-3.6637*
ARIis	-2.3396	-4.1340*
ARFDcv	-2.7436	-4.6431*
BLR	-2.7734	-3.1086*
lnCPI	-0.5429	-4.8654*
lnM3	-0.5941	-4.6197*
GDP	-2.1928	-5.6874*

Since the unit root test results show that each of the data series is I(1), the cointegration test based on the Johansen procedure is conducted. The maximum eigenvalue and trace statistics are calculated to test the null hypothesis of $r = 0$, i.e. no cointegration, versus the alternative hypothesis of cointegration. As shown in Table 3, both statistics reveal that the variables are cointegrated, which implies that there exists a long-run relationship between all deposit accounts and its determinants.

Table 3: Results of the Cointegration Test

Hypothesis		Dependent Variable						
Null	Alternative	IdSA	GdCA	BdCA	IdCA	GdIA	BdIA	IdIA
Test Statistics: Max Eigenvalue								
r = 0	r = 1	87.98*	92.41*	101.23*	105.56*	68.96*	90.16*	128.05*
r ≤ 1	r = 2	51.11	57.58	47.32	60.02	51.56	50.00	48.01
r ≤ 2	r = 3	47.07	50.12	44.42	46.40	45.15	43015	47.66
r ≤ 3	r = 4	44.39	33.38	26.65	26.03	29.78	26.45	30.48
Test Statistics: Trace								
r = 0	r ≥ 1	270.11*	278.07*	265.50*	280.29*	228.43*	252.17*	292.89*
r ≤ 1	r ≥ 2	182.13	185.67	164.27	174.73	165.46	162.01	164.84
r ≤ 2	r ≥ 3	131.02	128.08	116.95	114.71	113.90	112.01	116.83
r ≤ 3	r ≥ 4	83.95	77.97	72.53	68.31	68.80	68.86	69.17

* Significant at 5% level

Having verified the existence of a long run relationship in all deposit structure, we further investigated whether each variable entered statistically significant in the cointegrating vector by way of imposing restrictions and likelihood ratio tests which are asymptotically distributed as a chi-squared distribution with one degree of freedom. The cointegrating vector is normalised on the dependent variables. The LR test statistics, given in parentheses, are used to test the null hypothesis that each coefficient is statistically zero. The results are shown in Table 4.

Table 4: Multivariate Cointegration Results

Variable	RS_{is}	RS_{cv}	ARI_{is}	$ARFD_{cv}$	BLR	KLCI	CPI	M3	GDP
IdSA	0.30* (11.14)	-0.55* (8.48)			-0.04* (40.99)	-0.20* (43.11)	-4.21* (41.11)	-4.83* (42.24)	-0.003* (41.85)
GdCA			6.48* (28.36)	-10.60* (25.1)	6.40* (36.31)	-9.34* (36.63)	-10.8* (34.89)	5.46* (35.81)	0.37* (35.47)
BdCA			-0.94* (35.41)	1.85* (39.18)	-1.18 (5.89)	1.57* (10.69)	-1.75 (2.55)	-9.62* (14.67)	-0.046* (74.66)
IdCA			-1.09* (22.61)	2.51* (59.96)	-1.89* (64.80)	1.97* (62.68)	-8.89* (81.29)	-9.24* (79.78)	-0.06* (79.58)
GdIA			-0.06 (0.22)	0.72* (6.37)	-0.74* (5.95)	-0.80* (11.43)	-4.47* (11.36)	8.68* (11.11)	0.06* (12.62)
BdIA			-3.06* (41.28)	6.0* (55.20)	-3.99* (54.89)	4.23* (63.76)	-6.78* (68.14)	-16.1* (67.68)	-0.12* (75.85)
IdIA			-1.35* (66.63)	2.39* (57.56)	-1.46* (24.74)	2.01* (18.4)	0.78* (84.87)	-8.97* (84.6)	-0.08* (86.4)

* Denotes significant at the 5% level, LR test statistics in parentheses

With reference to the above table, most variables investigated showed significant relationship with the dependent variables. An exception is BLR and CPI, which were found not to be significant in explaining the deposit behaviour of business customers holding current account; and between ARIis and the investment

deposit held by the government. In the case of individual customers of savings account, evidence points to the normal behaviour of depositors whereby they will increase their deposits in line with the profit rate and shift these deposits to conventional banks when interest on saving account increases. This suggests that Islamic bank's saving account customers are profit oriented. With regards to the economic variables, both BLR and CPI do not have the expected sign. In the case of BLR, any increase of this figure should increase deposits by customers. One feasible explanation is that they believe Islamic bank will uphold Islamic teachings and continue its effort in providing services and giving out loans to its customers even during poor economic and financial conditions. Contrary to economic theory, inflation has a negative relationship with savings account. Such finding is most likely to be attributable to the operational of a good saving mechanism in Malaysia, i.e. The Employees Provident Fund (EPF) Scheme. Consumers are not motivated to save more in inflationary period since part of their income or wealth have been saved in the fund. It is also possible that consumers forgo their savings in an attempt to maintain their current standard of living during high inflationary times bearing in mind that they already have a certain amount of savings to fall back in the form of EPF.

Financial variables have similar impact on both individual current and investment account customers. Under normal conditions, increase in profit takes place after a rise in the interest rate of conventional bank. It is a possibility that individual customers of current account will shift their funds to either investment account of Islamic bank or fixed deposit of conventional banks. In the case of investment account customers, a plausible explanation for the negative relationship between level of deposit and the profit rate is that the rate of profit of investment accounts of Islamic bank are only known by depositors at the end of the deposit or maturity period, whereas rates of interest for conventional deposits are known in advance. Given this stipulation, there is a possibility that Islamic bank customers will liquidate their deposits and moved to conventional banks for better returns. With regards to the interest rate, one of the possible reasons for this positive relationship is that the customers expect higher returns will be paid by Islamic bank at maturity. Similar to savings account, we found BLR and CPI to be negatively related to current account holders. Interestingly individual customers reacted positively to movement in KLCI. A possible reason for this result stems from the depositors behaviour of disposing their shares and keeping their monies in the savings account when stock prices are at an upturn. For BLR and KLCI, customers of investment account behave in the same way as with customers of current account. A high BLR means that borrowing has become more costly than before. Hence, potential borrowers will, therefore, postpone their investment plans until interest rates fall to their more normal level.

The business customers of current and investment accounts have similar behavioural pattern. With the exception of M3 and GDP, this study finds the relationships between dependent variables and both financial and economic

variables are not in line with the saving theories. In the case of financial variables, ARIis and ARFDcv have a negative and positive relationship, respectively. We believe similar explanation given for individual customers is applicable. Likewise, the effect of BLR, KLCI and CPI on business customers is the same with individual customers of current and investment accounts. An increase in the rate of interest has some adverse psychological effects on business confidence. In a way, it acts as a red signal to businessmen that bad times are ahead. This by itself will help to dampen their enthusiasm for additional spending on investment.

As for the government current account holders, the only two variables that do not conform to the saving theories are CPI and M3. This finding is, however, valid for the government sector because in normal circumstances inflation is caused by excessive supply of money. Government usually issues more money to finance the expansion of economic activity and the growing size of government expenditure, thus increasing the amount of deposits kept by the government in the current account. These variables are found to have the same impact on the investment account. Financial variables and BLR have similar effect on the government accounts as with other customers.

As a further test of the cointegration hypothesis, a VECM is employed. In addition to this, the size of the error or deviation in the cointegrating relationship and the speed of adjustment among the variables considered can be evaluated via the estimation of VECMs. Estimates of the error correction terms (ECTs) are given in Table 5. Overall, the results reveal that the ECTs are negative and statistically significant for all deposit accounts in Islamic banks. This implies that all dependent variables have the tendency to adjust to any deviations in the long-run equilibrium Current account of government exhibits the fastest speeds of adjustment whereby 41% of the system disequilibrium are corrected the next month as compared to 23% and 13% of the current accounts holder of business and individuals. Savings account of Islamic banks corrects 33% of the deviations from the long-run relationships in a single year. The investment accounts held by government, business and individuals correct for only 28%, 29% and 20% of any deviations from the cointegrating relationship in the short-run, respectively. The ECTs for all deposit accounts, with exception of the current account held by government, are reasonably small which suggest that the speed of adjustment to the long-run equilibrium following a shock is moderate.

In the short-run, savings account reacted significantly to changes in return on savings from the conventional system and GDP. The profit rate on investment deposits in the Islamic system was found to be significant in the short-run for the current account deposit of the government, whilst the return on fixed deposits in the conventional system significantly explains the changes in the current account deposits of business and individuals. For investment deposits held by government and business, the short-run variations in the dependent variables are mainly determined by variations in the return on investment in the Islamic system,

composite index and money supply. The investment deposits held by individuals are significantly affected by movements in the return on fixed deposits in the conventional system, inflation rate, money supply and GDP in the short-run.

Table 5: Error Correction Models

	IdSA	GdCA	BdCA	IdCA	GdIA	BdIA	IdIA
RS_{is}	-0.04 (-0.64)						
RS_{cv}	-0.33* (-2.58)						
ARI_{is}		0.30* (1.69)	0.13 (1.28)	0.13 (1.11)	0.21* (2.40)	0.28* (2.25)	0.15 (1.57)
$ARFD_{cv}$		0.15 (0.94)	0.14* (1.68)	0.40* (4.08)	0.03 (0.56)	-0.16 (-1.41)	0.22* (2.51)
BLR	-0.17* (-5.62)	0.01 (0.05)	-0.08 (-0.95)	-0.04 (-0.35)	-0.06 (-0.88)	0.06 (0.49)	0.14 (1.56)
KLCI	-0.025 (-0.26)	0.27 (0.94)	0.04 (0.26)	-0.01 (-0.05)	-0.19* (-1.75)	-0.42* (-2.03)	0.001 (0.46)
CPI	1.63 (0.58)	-8.00 (-0.85)	6.15 (1.26)	-2.57 (-0.45)	0.70 (0.17)	3.15 (0.49)	14.35* (2.88)
M3	0.57 (0.55)	2.47 (0.69)	2.01 (1.01)	1.90 (0.87)	5.04* (3.84)	4.99* (2.01)	-5.81* (-2.96)
GDP	0.02* (2.48)	0.01 (0.16)	-0.014 (-1.28)	0.012 (0.97)	0.01 (1.30)	-0.01 (-0.29)	-0.02* (-1.73)
ECT	-0.33* (-5.0)	-0.41* (-2.03)	-0.23* (-2.22)	-0.13* (-4.84)	-0.28* (-4.83)	-0.29* (-2.20)	-0.20* (-8.40)

6. Concluding Remarks

This study supports the long-run relationship between the amount of deposits placed in the Islamic banking system in Malaysia by various economic units; and financial and economic variables. Our findings suggest that economic units have similar behavioural patterns. Furthermore, we find evidence to suggest that Islamic bank depositors are influenced by both financial and economic variables, which is in contrast with the Islamic saving theories. For example, all Islamic bank depositors are sensitive to movement in the financial variables. Therefore, management of Islamic banks should pay more attention not only in managing their profit rates but also to the movement in the interest rates of conventional banks.

As elaborated in the theoretical consideration section, Muslims should be guided by Islamic doctrines when making their economic decisions. These doctrines require that Muslims should not place profit maximization as the sole

factor in establishing relationship with Islamic banks. To ensure that Muslims are really adhered to the Islamic concept of wealth and Islamic concept of success is not an easy task. Consequently, every party must play the role of educating customers of Islamic banking system. The methods and steps taken in educating these groups are indeed formidable and challenging.

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COMMENTS

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